ADAM M. SCHNEIDER, PhD

Professional Research Assistant, CU Boulder
Reanalysis and Reforecast Associate Scientist, CIRES
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Education and Training

2006–2010: Bowling Green State University; Bowling Green, Ohio; United States
Bachelor of Science; Mathematics (May 8, 2010)

2011–2018: The University of Michigan; Ann Arbor, MI; United States
Master of Science; Atmospheric, Oceanic and Space Sciences (April 26, 2018)
Doctor of Philosophy; Atmospheric, Oceanic and Space Sciences (August 17, 2018)

2018–2021: University of California, Irvine; Irvine, California; United States
Postdoctoral Scholar; Earth System Science

Professional Experience

2012–2018: The University of Michigan; Ann Arbor, MI; United States
Graduate Research Assistant; Department of Atmospheric, Oceanic and Space Sciences

Principal Investigator(s): Mark G. Flanner
Linking cryospheric processes across scales to model non-linear albedo feedback

- Assessed multi-decadal surface albedo feedback in the Coupled Model Intercomparison Project multi-model ensemble
- Developed a parallelized Monte-Carlo photon tracking model to inform snow bidirectional reflectance measurements
- Designed the Near-Infrared Emitting and bidirectional-Monitoring Dome – a ground-based instrument that measures (1.3 µm) bidirectional reflectance – to study snow metamorphism

2018–2021: University of California, Irvine; Irvine, California; United States
Postdoctoral Scholar; Department of Earth System Science

Principal Investigator(s): Charles S. Zender*;* Stephen F. Price (Los Alamos National Lab)
Improving Ice Sheet Surface Mass Balance in the Energy Exascale Earth System Model (E3SM) Through Improvements to the Physical Snowpack Model

- Designed the firn layering implementation and density parameterization in version 2 of the United States Department of Energy's E3SM
- Conducted E3SM simulation ensembles at the National Energy Research Scientific Computing Center to condition firn and evaluate ice sheet climatic mass balance

2021–2022: University of California, Irvine; Irvine, California; United States
Associate Specialist; Department of Earth System Science

Principal Investigator(s): Charles S. Zender; Matthew J. Hoffman (Los Alamos National Lab)
Framework for Antarctic System Science in E3SM

- Evaluated Antarctic ice sheet melt rates in E3SM and regional climate model simulations to determine mission critical deficiencies relevant to firn processes
- Served as the snowpack and firn task leader

2022–present: University of Colorado Boulder (CU Boulder); Boulder, Colorado; United States
Professional Research Assistant and Reanalysis and Reforecast Associate Scientist; Cooperative Institute for Research in Environmental Sciences (CIRES), affiliated with the National Oceanic and Atmospheric Administration (NOAA) Physical Sciences Laboratory

Principal Investigator(s): Sergey Frolov (NOAA Physical Sciences Laboratory)
NOAA United Forecast System: Data Assimilation, Reanalysis and Reforecast

- Supported production of the Modeling and Data Assimilation Division's replay simuations
- Managed deveopment of diagnostic tools for reanalysis and reforecast product evaluation
- Chaired search committees to hire reanalysis and data assimilation research scientists

Honors and Awards

2006–2007: *Academic Competitiveness Grant* (750 USD); Bowling Green, Ohio

2006–2007, 2009–2010: *Federal Pell Grants* (6,825 USD); Bowling Green, Ohio

2006–2010: *University Freshman Academic Scholarship* (8,000 USD); Bowling Green, Ohio

2009–2010: *Friends of the University Libraries Scholarship* (500 USD); Bowling Green, Ohio

2022: *2nd place, Business Pitch Competition*; Irvine, California

Leadership and Service

2013–2015: The University of Michigan; Ann Arbor, Michigan; United States
Grader; Instrumentation for Atmospheric and Space Sciences (AOSS 462)
Grader; Radiative Transfer (AOSS 532)

2020: Copernicus Publications; Göttingen, Germany
Referee; The Cryosphere

2021–2022: United Auto Workers, Local #5810; Irvine, California; United States
Campus Recording Secretary; Postdoc Unit
Head Steward; Academic Researcher Unit

2022: University of California, Irvine; Irvine, California; United States
Panelist; Climate Alliance Conference; Session 1: The Changing Climate System

2022: Elsevier; Amsterdam, Netherlands
Reviewer; Remote Sensing of Environment

2023: American Meteorological Society; Boston, Massachusetts; United States
Reviewer; Journal of Applied Meteorology and Climatology
Reviewer; Journal of Climate

2023: American Geophysical Union; Washington, D.C.; United States
Reviewer; Journal of Geophysical Research - Earth Surface

Professional Certifications

2019: *Safety Training Self-Assessment* (expires August 25, 2025)
University of California, Irvine; Irvine, California; United States

2022: *UC Ethics and Compliance Briefing for Researchers* (expires February 22, 2024)
University of California, Irvine; Irvine, California; United States

2022: *Industry Insights for STEM scientists: Business skills & Business Model Canvas*
University of California, Irvine; Irvine, California; United States

2023: *Records Management Training*
National Oceanic and Atmospheric Administration; United States Department of Commerce

Peer-Reviewed Publications

Schneider, A., Flanner, M., & Perket, J. (2018). Multidecadal variability in surface albedo feedback across CMIP5 models. *Geophysical Research Letters*, 45, 1972–1980. https://doi.org/10.1002/2017GL076293

Smith, B. E., Gardner, A., **Schneider, A.**, & Flanner, M. (2018). Modeling biases in laser-altimetry measurements caused by scattering of green light in snow. *Remote Sensing of Environment*, *215*, 398–410. https://doi.org/10.1016/j.rse.2018.06.012

Schneider, A., Flanner, M., De Roo, R., & Adolph, A. (2019). Monitoring of snow surface near-infrared bidirectional reflectance factors with added light-absorbing particles. *The Cryosphere*, *13*(6), 1753–1766. https://doi.org/10.5194/tc-13-1753-2019

Schneider, A. M., Zender, C. S., & Price, S. F. (2022). More realistic intermediate depth dry firn densification in the Energy Exascale Earth System Model (E3SM). *Journal of Advances in Modeling Earth Systems*, 14, e2021MS002542. https://doi.org/10.1029/2021MS002542

Fair, Z., Flanner, M., **Schneider, A.**, & Skiles, S. M. (2022). Sensitivity of modeled snow grain size retrievals to solar geometry, snow particle asphericity, and snowpack impurities, *The Cryosphere, 16*, 3801–3814. https://doi.org/10.5194/tc-16-3801-2022

Schneider, A., Zender, C., Loeb, N., & Price, S. (2023). Use of shallow ice core measurements to evaluate and constrain 1980–1990 global reanalyses of ice sheet precipitation rates. *Geophysical Research Letters*, 50, e2023GL103943. https://doi.org/10.1029/2023GL103943

Published Data Sets

Adam Schneider, Mark Flanner. (2018). *Supporting data for the Near-Infrared Emitting and Reflectance-Monitoring Dome*. [Data set], University of Michigan - Deep Blue Data. https://doi.org/10.7302/Z23F4MVC

Adam M. Schneider. (2020). *E3SM simulation results and associated python analysis scripts (1.0.0)*. [Data set]. Zenodo. https://doi.org/10.5281/zenodo.5950802

Adam Schneider (2023). *amschne/lnd_srf_for: First production ready release (v1.0.0)*. Zenodo. https://doi.org/10.5281/zenodo.8008098

Adam Schneider, Jordan Schneider, Zachary Fair, & Mark Flanner. (2023). *amschne/monte_carloMPI: Production ready release (python v3) (v1.0.0)*. Zenodo. https://doi.org/10.5281/zenodo.8076315

Symposia Presentations

Schneider, A. M., and Flanner, M. G. (2012). Evaluating temporal evolution of surface albedo feedback using the CESM1. *Abstract A21D-0081 presented at 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec*.

Schneider, A. M., and Flanner, M. (2013). Assessing decadal-scale variability in surface albedo feedback across the CMIP5 simulations. *Abstract A21B-0028 presented at 2013 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec*.

Flanner, M., and **Schneider, A. M.** (2014). Multidecadal Variability in Surface Albedo Feedback. *Abstract A21H-3132 presented at 2014 Fall Meeting, AGU, San Francisco, Calif., 15-19 Dec*.

Schneider, A. M., and Flanner, M. (2014). Measuring Snow Grain Size with the Near-Infrared Emitting Reflectance Dome (NERD). *Abstract C51B-0270 presented at 2014 Fall Meeting, AGU, San Francisco, Calif., 15-19 Dec*.

Schneider, A. M., Flanner, M., Yang, P., Yi, B., Huang, X., and Feldman, D. (2015). Monte Carlo Photon Modeling to Explore the Dependence of Snow Bidirectional Reflectance on Grain Shape and Size. *Abstract C13C-0819 presented at 2015 Fall Meeting, AGU, San Francisco, Calif., 14-18 Dec*.

Schneider, A. M., Flanner, M., Yang, P., Yi, B., Huang, X., and Feldman, D. (2016). How Can Polarization States of Reflected Light from Snow Surfaces Inform Us on Surface Normals and Ultimately Snow Grain Size Measurements? *Abstract C33B-0790 presented at 2016 Fall Meeting, AGU, San Francisco, Calif., 11-15 Dec*.

Schneider, A. M., and Flanner, M. (2017). In Situ Observations of Snow Metamorphosis Acceleration Induced by Dust and Black Carbon. *Abstract C13B-0954 presented at 2017 Fall Meeting, AGU, New Orleans, Louis., 11-15 Dec*.

Kennedy, J. H., Evans, K. J., Hoffman, M. J., Price, S. F., and **Schneider, A. M.** (2019). Evaluating the surface mass balance from E3SM with LIVVkit 3.0. *Abstract C23B-1540 presented at 2019 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec*.

Price, S. F., Ng, E. G., Asay-Davis, X., Bassis, J. N., Bertagna, L., Book, C., Comeau, D. S., Dunlop, M., Evans, K. J., Hoffman, M. J., Jakeman, J., Kachuck, S. B., Kennedy, J. H., Martin, D. F., Perego, M., Petersen, M. R., Salinger, A., **Schneider, A. M.**, Stadler, G., … Zhang, T. (2019). Probabilistic Sea Level Projections from Ice Sheet and Earth System Models (ProSPect). *Abstract C51C-1292 presented at 2019 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.*

Schneider, A. M., Zender, C. S., and Price, S. F. (2019). Evaluation of E3SM snowpack and firn initialization and early 20th century simulations. *Abstract C51C-1321 presented at 2019 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.*

Price, S. F. D., Hillebrand, T. R., Hoffman, M. J., Perego, M., **Schneider, A.**, Wang, W., Wolfe, J. D., & Zender, C. (2020). Towards a coupled Greenland ice sheet in E3SM, *presented at 2020 Earth System Model Development (ESMD) program area Principle Investigator (PI) and E3SM Annual All-Hands meeting, online, 26-29 Oct.*

Schneider, A., Zender, C., and Price, S. (2020). Improving snow compaction and firn densification on E3SM's ice sheets, *presented at 2020 Earth System Model Development (ESMD) program area Principle Investigator (PI) and E3SM Annual All-Hands meeting, online, 26-29 Oct.*

Whicker, C., Flanner, M., Dang, C., Cook, J. M., Williamson, C., **Schneider, A.**, and Zender, C. S. (2020). The Effects of Bubbles and Biotic Impurities on Snow and Ice Radiative Transfer Properties. *Abstract C011-0006 presented at 2020 Fall Meeting, AGU, online, 1-17 Dec.*

Schneider, A., Price, S., Wolfe, J., and Zender, C. (2021). Surface Mass Balance of the Greenland Ice Sheet in the Energy Exascale Earth System Model. *Abstract EGU21-14017 presented at 2021 EGU General Assembly, online, 19-30 Apr.* https://doi.org/10.5194/egusphere-egu21-14017

Schneider, A., Zender, C., and Price, S. (2021). Precipitation Discrepancies over Ice Sheets in the WFDE5 and CRUNCEP Land Surface Forcing Datasets and their Impact on Firn Density in E3SM. *Abstract C45B-1006 presented at 2021 Fall Meeting, AGU, New Orleans, Louis. & online, 13-17 Dec.*

Fair, Z. Flanner, M., Neumann, T., Vuyovich, C., and **Schneider, A.** (2021). Quantifying volumetric scattering bias in ICESat-2 and Operation IceBridge altimetry over snow-covered surfaces. *Abstract C55A-0568 presented at 2021 Fall Meeting, AGU, New Orleans, Louis. & online, 13-17 Dec.*

Whicker C., Flanner, F., Dang, C., Zender, C., Cook, J., Gardner, A., and **Schneider, A.** (2021). SNICAR-ADv4: A Novel Physically Based Radiative Transfer Model for Glacier Snow, Firn, and Ice. *Abstract C55B-0595 presented at 2021 Fall Meeting, AGU, New Orleans, Louis. & online, 13-17 Dec.*

Schneider, A., Loeb, N., and Zender, C. (2022). Decadal Precipitation Rates from the 1980 to 1990 ECMWF Reanalysis v5 Verified over the Greenland and Antarctic Ice Sheets. *Abstract J5.5 presented at 2022 Collective Madison Meeting, Madison, Wisco. & online, 8-12 Aug.*

Technical Skills and Abilities

Programming: Python, statistical models, exploratory data analysis and visualization, parallel applications using Message Passing Interface implementations, and Git for software version control.

Other: Earth system model code development, simulations, diagnostic verification and analysis of coupled and stand-alone configurations; geospatial data analysis and cartography.

Professional Memberships

2012–present: American Geophysical Union; Washington, D.C., United States

2020–present: American Meteorological Society; Los Angeles, California; United States

2020–2022: United Auto Workers, Local #5810; Irvine, California; United States

2021: European Geosciences Union; Munich, Germany

2021: Society for Industrial and Applied Mathematics; Philadelphia, Pennsylvania; United States